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Attorney Docket No.: Navy Case 82185

Applicants: Michael W. Masters *et al.*  
Serial No.: 09/864,821  
Filed: May 24, 2001  
Page: 2 of 16

**Amendments to the Claims:**

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) In a processor in a distributed environment comprised of hosts, each host instantiating ~~copies~~ a copy of a scalable application, a ~~program control device responsive to signals, the processor comprising:~~
  - an instrumentation collector that receives an instrumentation command from the host that executes the scalable application;
  - a quality of service manager that monitors the instrumentation command to determine application quality of the scalable application;
  - a history server that receives an operating system command from the host;
  - a host load analyzer that analyzes a load responsive to the history server to determine an operating load;
  - a resource manager that receives the application quality and the operating load to determine a resource allocation for the host; and
  - a program control that receives the resource allocation and a program signal from the distributed environment to control the host.

wherein the signals including ~~commands for ordering instrumentation command~~ includes a start up, a shutdown or and ~~moving a move~~ of a selected ~~one copy~~ of the copies from the hosts, the ~~commands system operating command~~ based on a first information regarding performance of all copies of the scalable application and a second information regarding performance of the hosts.
2. (Currently Amended) On a processor in a distributed environment comprised of hosts, each host instantiating at least one copy of a managed characteristic application, the processor comprising:
  - an instrumentation collector that receives an instrumentation command from the host that executes the managed characteristic application;

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 3 of 16

Attorney Docket No.: Navy Case 82185

a quality of service manager that monitors the instrumentation command to determine application quality of the managed characteristic application;

a history server that receives an operating system command from the host;

a host load analyzer that analyzes a load responsive to the history server to determine an operating load;

a resource manager that receives the application quality and the operating load to determine a resource allocation for the host; and

a program control that receives the resource allocation and a program signal from the distributed environment to control the host.

wherein other copies of the managed characteristic application have been instantiated on other hosts, a program control device responsive to signals, the signals including commands for ordering instrumentation command orders at least one of a start up of an additional copy of the managed characteristic application or configuration, a shutdown of the at least one copy of the managed characteristic application, and moving a move of the at least one copy of the managed characteristic application, the commands operating system command is based on a first information regarding performance and status of all applications including all copies of the managed characteristic application and a second information regarding the performance of the host.

3. (Previously Presented) The program control device as recited in claim 2, wherein the managed characteristic application comprises a scalable application.

4. (Previously Presented) The program control device as recited in claim 2, wherein the managed characteristic application comprises a fault tolerant application, where the degree of fault tolerance is selectable by a user.

5. (Previously Presented) The program control device as recited in claim 2, wherein the managed characteristic application comprises a selectable priority application.

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 4 of 16

Attorney Docket No.: Navy Case 82185

6. (Previously Presented) The program control device as recited in claim 2, wherein the managed characteristic application further responds to user-initiated control actions.
7. (Previously Presented) The program control device as recited in claim 2, wherein the program control device modifies the configuration of the managed characteristic application responsive to instantaneous tasking by a user.
8. (Currently Amended) ~~In A processor in a distributed environment comprised of hosts instantiating copies a copy of a managed characteristic application, a program control device responsive to signals, the signals including commands for ordering the processor comprising:~~  
an instrumentation collector that receives an instrumentation command from the host that executes the scalable application:  
a quality of service manager that monitors the instrumentation command to determine application quality of the scalable application;  
a history server that receives an operating system command from the host;  
a host load analyzer that analyzes a load responsive to the history server to determine an operating load;  
a resource manager that receives the application quality and the operating load to determine a resource allocation for the host; and  
a program control that receives the resource allocation and a program signal from the distributed environment to control the host,  
wherein the instrumentation command includes start up, configuration, shutdown and moving of a selected one of the managed characteristic applications, the commands-system operating command is based on a first information regarding performance and status of all running applications including all of the managed characteristic applications, a second information regarding performance of the hosts, and a third information regarding performance of the distributed environment.
9. (Previously Presented) The program control device as recited in claim 8, wherein the managed characteristic application comprises a scalable application.

Applicants: Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 5 of 16

Attorney Docket No.: Navy Case 82185

10. (Previously Presented) The program control device as recited in claim 8, wherein the managed characteristic application comprises a fault tolerant application, where the degree of fault tolerance is selectable by a user.

11. (Previously Presented) The program control device as recited in claim 8, wherein the managed characteristic application comprises a selectable priority application.

12. (Previously Presented) The program control device as recited in claim 8, wherein the managed characteristic application further responds to user-initiated control actions.

13. (Previously Presented) The program control device as recited in claim 8, wherein the program control device modifies the configuration of the managed characteristic application responsive to instantaneous tasking by a user.

14. (Currently Amended) In A processing program executable on a processor in a grid system comprises of that includes N hosts instantiating M managed characteristic applications, a program control software instantiated by and located on at least the N hosts, the processing program comprising:

instructions for an instrumentation collector to receive an instrumentation command from the host that executes the M managed characteristic applications, wherein N program control agents residing on a respective one of the N hosts and providing direct control over startup, configuration, moving, and shutdown of applications on a respective one of the N hosts;

instructions for a quality of service manager to monitor the instrumentation command and to determine application quality of the M managed characteristic application applications;

instructions for a history server to receive an operating system command from the N hosts, the operating system command being based on information regarding performance and status of all of the M managed characteristic applications;

instructions for a host load analyzer to analyze a load responsive to the history server to determine an operating load;

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 6 of 16

Attorney Docket No.: Navy Case 82185

instructions for a resource manager to receive the application quality and the operating load and to determine a resource allocation for the N hosts; and

instructions for a program controller operatively coupled to the N program control agents, the program controller receiving one of the interactive and automatic application control requests and generates specific control orders which are sent to the individual N program control agents responsive thereto;

where N and M are positive integers.

15. (Currently Amended) The processing program control software as recited in claim 14, wherein the specific control orders include one of startup orders permitting instantiation of an  $(M+1)^{\text{th}}$  managed characteristic application or shutdown and configuration orders permitting a status change regarding one of the M managed characteristic applications.

16. (Currently Amended) The processing program control software as recited in claim 14, further comprising:

instructions for K program control displays permitting interactive control of distributed applications,

where K is a positive integer.

17. (Currently Amended) The processing program control software as recited in claim 16, wherein the K program control displays depict current status and the configuration of the M managed characteristic applications.

18. (Currently Amended) The processing program control software as recited in claim 16, wherein the K program control displays depict current status of all applications instantiated on the grid system.

19. (Currently Amended) The processing program control software as recited in claim 16, wherein each of the K program control displays comprises a graphical user interface (GUI)

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 7 of 16

Attorney Docket No.: Navy Case 82185

permitting a user to determine the status of each of the N program control agents and the program controller.

20. (Currently Amended) The processing program control software as recited in claim 16, wherein the K program control displays respond to one or more L configuration files, wherein L is a positive integer.

21. (Currently Amended) The processing program control software as recited in claim 20, wherein each of the K program control displays permits a user to one of create new configuration files and edit an existing one of the L configuration files.

22. (Currently Amended) The processing program control software as recited in claim 20, wherein selected ones of the L configuration files correspond to predefined scenario configurations.

23. (Currently Amended) The processing program control software as recited in claim 14, wherein the specific control orders permit a subset of the M managed characteristic applications to be started and stopped.

24. (Currently Amended) The processing program control software as recited in claim 23, wherein all of the M managed characteristic applications in the subset are started and stopped simultaneously.

25. (Currently Amended) The processing program control software as recited in claim 23, wherein the M managed characteristic applications in the subset are started and stopped in a predetermined sequence.

26. (Currently Amended) The processing program control software as recited in claim 23, wherein all of the M managed characteristic applications in the subset are started and stopped in

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 8 of 16

Attorney Docket No.: Navy Case 82185

a predetermined sequence having a respective delay time between each event in the predetermined sequence.

27. (Currently Amended) The processing program control software as recited in claim 23, wherein a first subset of the M managed characteristic applications comprise scalable applications and a second subset of the M managed characteristic applications comprise fault tolerant applications, where the degree of fault tolerance is selectable by a user.

28. (Currently Amended) The processing program control software as recited in claim 23, wherein a first subset of the M managed characteristic applications comprise selectable priority applications and a second subset of the M managed characteristic applications comprise fault tolerant applications, where the degree of fault tolerance is selectable by a user.

29. (Currently Amended) The processing program control software as recited in claim 23, wherein a first subset of the M managed characteristic applications comprise scalable applications, a second subset of the M managed characteristic applications comprise fault tolerant applications, where the degree of fault tolerance is selectable by a user, and a third subset of the M managed characteristic applications comprises selectable priority applications.

30. (Currently Amended) The processing program control software as recited in claim 14, wherein the M managed characteristic applications comprise scalable applications.

31. (Currently Amended) The processing program control software as recited in claim 14, wherein the M managed characteristic applications comprise fault tolerant applications, where the degree of fault tolerance is selectable by a user.

32. (Currently Amended) The processing program control software as recited in claim 14, wherein the M managed characteristic applications comprise selectable priority applications.

Applicants: Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 9 of 16

Attorney Docket No.: Navy Case 82185

33. (Currently Amended) The processing program control software as recited in claim 14, wherein:

each of the N hosts operates in accordance with a selected one of R operating systems; the N program control agents implement the orders via system call mechanisms specific to the particular operating system of a corresponding one of the N hosts;

R is a positive integer; and

N is greater than or equal to R.

34. (Currently Amended) The processing program control software as recited in claim 14, wherein each of the N program control agents provides feedback to the program controller regarding the current status and configuration of all applications running on a respective one of the N hosts, and provides feedback to the program controller regarding host status for the respective one of the N hosts.

35. (Currently Amended) The processing program control software as recited in claim 14, further comprising:

K program control displays permitting interactive control of distributed applications, wherein:

each of the K program control displays comprises a graphical user interface (GUI) permitting a user to determine the status of each of the N program control agents and the program control function;

each of the K program control displays responds to a respective subset of L configuration files, wherein K and L are positive integers, and wherein K, L, and N may be equal to or different than one another; and

the program controller, using information from specification files different than the L configuration files, generates the specific control orders by translating the control function requests into the specific control orders.

36. (Currently Amended) ~~In a processing program in a distributed environment comprises of that includes~~ N hosts instantiating M managed characteristic applications, ~~program control~~



Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 10 of 16

Attorney Docket No.: Navy Case 82185

software and instantiated by at least the N hosts, the processing program comprising:

instructions for an instrumentation collector to receive an instrumentation command from the host that executes the M managed characteristic applications, wherein N program control agents residing on a respective one of the N hosts and providing direct control over startup, configuration, moving, and shutdown of applications on the respective one of the N hosts;

instructions for a quality of service manager to monitor the instrumentation command and to determine application quality of the M managed characteristic application applications;

instructions for a history server to receive an operating system command from the N hosts, the operating system command being based on information regarding performance and status of all of the M managed characteristic applications;

instructions for a host load analyzer to analyze a load responsive to the history server to determine an operating load;

instructions for a resource manager to receive the application quality and the operating load and to determine a resource allocation for the N hosts;

instructions for a program controller operatively coupled to the N program control agents, which receives one of user-initiated and program initiated application control requests and information comprising first information regarding performance and status of all running applications, including all of the managed characteristic applications, second information regarding performance of the hosts, and third information regarding performance of the distributed environment, and which generates specific control orders which are sent to the individual N program control agents responsive thereto; and

instructions for K program control displays permitting generation of the user-initiated application control requests applied to the program controller, wherein:

each of the K program control displays instantiates a graphical user interface (GUI) permitting a user to determine the status of each of the N program control agents and the program control function;

each of the K program control displays responds to a respective subset of L configuration files;

Applicants : Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 11 of 16

Attorney Docket No.: Navy Case 82185

the program controller, using information from specification files different than the L configuration files, generates the specific control orders by translating the control function requests into the specific control orders; and

K, L, M and N are positive integers ~~that may be equal to or different than one another.~~

37. (Currently Amended) The processing program control software as recited in claim 36, wherein the specific control orders include one of startup orders permitting instantiation of an (M+1)<sup>th</sup> managed characteristic application or shutdown, and configuration orders permitting a status change regarding one of the M managed characteristic applications.

38. (Currently Amended) The processing program control software as recited in claim 36, wherein:

each of the N hosts operates in accordance with a selected one of R operating systems;  
the N program control agents implement the orders via system call mechanisms specific to the particular operating system of a corresponding one of the N hosts;  
R is a positive integer; and  
N is greater than or equal to R.

39. (Currently Amended) Software stored on at least one host for converting N networked hosts into a resource managed system instantiating M managed characteristic applications, comprising:

instructions for a first function group which monitors the host and network resources;  
instructions for a second function group which provides general-purpose application event reporting and event correlation capabilities to determine performance and status of the M managed characteristic applications;

instructions for a third function group which provides the reasoning and decision-making capabilities for the resource managed system to determine an operating load; and

instructions for a fourth function group which provides program control capabilities permitting starting, stopping, moving, and configuring of selected ones of the M managed characteristic applications on respective ones of the N hosts in the resource managed system,

Applicants: Michael W. Masters *et al.*  
Serial No.: 09/864,821  
Filed: May 24, 2001  
Page: 12 of 16

Attorney Docket No.: Navy Case 82185

based on the performance and the status of all of the M managed characteristic applications, the fourth function group further comprising:

instructions for N program control agents residing on a respective one of the N hosts and providing direct control over startup, configuration, and shutdown of the selected ones of the M managed characteristic applications on the respective one of the N hosts; and

instructions for a program controller operatively coupled to the N program control agents which, the program controller determining a resource allocation for the M managed characteristic applications in response to the operating load, wherein the program controller receives one of interactive and automatic application control requests and generates specific control orders which are sent to the individual N program control agents responsive thereto, wherein the automatic application control request is generated by the third function group, wherein M and N are positive integers, and ~~wherein M and N may be equal to or different than one another.~~

40. (Previously Presented) The software as recited in claim 39, wherein the specific control orders include one of startup, shutdown, and configuration orders.

41. (Previously Presented) The software as recited in claim 39, wherein the fourth function group further comprises:

K program control displays permitting interactive control of the M managed characteristic applications.

42. (Previously Presented) The software as recited in claim 41, wherein each of the K program control displays comprises a graphical user interface (GUI) permitting a user to determine the status of each of the N program control agents and the program controller.

43. (Previously Presented) The software as recited in claim 41, wherein the K program control displays respond to L configuration files, wherein L and K are positive integers.

Applicants: Michael W. Masters *et al.*  
Serial No. : 09/864,821  
Filed : May 24, 2001  
Page : 13 of 16

Attorney Docket No.: Navy Case 82185

44. ((Previously Presented) The software as recited in claim 43, wherein each of the K program control displays permits a user to one of create a new configuration file and edit an existing one of the L configuration files.

45. (Previously Presented) The software as recited in claim 43, wherein selected ones of the L configuration files correspond to predetermined scenario configurations.

46. (Previously Presented) The software as recited in claim 39, wherein:  
each of the N hosts operates in accordance with a selected one of R operating systems;  
the N program control agents implement the orders via system call mechanisms specific to the particular operating system of a corresponding one of the N hosts; and  
N and R are positive integers and N is greater than or equal to R.

47. (Previously Presented) The software as recited in claim 39, wherein each of the N program control agents provides feedback to the program controller regarding the current status and configuration of all applications running on a respective one of the N hosts.

48. (Currently Amended) The software as recited in claim 39, wherein the fourth function group further comprises:

K program control displays permitting interactive control of distributed applications, wherein:

each of the K program control displays comprises a graphical user interface (GUI) permitting a user to determine the status of each of the N program control agents and the program controller;

each of the K program control displays responds to a subset of L configuration files, wherein L and K are positive integers; and

the program controller, using information from specification files different than the L configuration files generates the specific control orders by translating the control function requests into the specific control orders.